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-	108	(optimiz\$5 with (program\$1 or process\$2)) same (model\$3 with optimiz\$5 with object\$1)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/08/31 16:35
-	2	4860204.pn.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2004/09/01 11:57
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Gerhard Gröger, Lutz Plümer

November 2003 **Proceedings of the eleventh ACM international symposium on Advances in geographic information systems**Full text available:  pdf(420.63 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article provides a formal data model to cover many 3D applications in GIS. It is based on a 2D model and preserves the algorithmic and conceptual simplicity of the 2D case as much as possible. Integrity axioms guarantee the consistency of the model in a mathematically provable way. These axioms are effectively and efficiently checkable by automatic procedures. The model extends Digital Terrain Models by allowing for vertical walls and projections like balconies or ledges. The conceptual sim ...

Keywords: 3D, GIS, axioms, completeness, consistency, correctness, maps**2** [Inelegant Transportation Systems and Network Algorithms: Network planning using geomorphology](#)


Ingo Petzold, Gerhard Gröger, Lutz Plümer

November 2001 **Proceedings of the ninth ACM international symposium on Advances in geographic information systems**Full text available:  pdf(2.73 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Connecting several locations, for example towns by roads, is a typical network planning problem. A first approach would be to connect pairs of nodes (network language term for location) with a straight edge. The result is a connected network not considering the total network length and the average trip length. The construction of new junctions, so called Steiner Points, for reducing the total network length and thereby the global costs is more or less known. On the other hand slopes, obstacles o ...

Keywords: GIS, digital terrain model (DTM), geomorphology, network planning, road planning, steiner points, triangulated irregular network (TIN), water flow**3** [Provably correct and complete transaction rules for GIS](#)

Gerhard Gröger, Lutz Plümer

November 1997 **Proceedings of the fifth ACM international workshop on Advances in geographic information systems**Full text available:  pdf(729.74 KB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



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1 [A distributed real-time knowledge base for teams of autonomous systems in manufacturing environments](#)

Johann Schweiger, Andreas Koller

May 1994 **Proceedings of the seventh international conference on Industrial and engineering applications of artificial intelligence and expert systems**

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Stavros A. Zenios

June 1990 **ACM Transactions on Mathematical Software (TOMS)**, Volume 16 Issue 2

Full text available: pdf (2.05 MB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#), [review](#)

Research in network optimization has reached the stage where large-scale problems-linear or non-linear, pure or generalized-are solved very efficiently with minimal computing resources. Representing such problems for solution on the computer, however, remains a rather cumbersome task. Taking advantage of developments in high-level modeling languages, we design and implement integrated systems to facilitate the representation and solution of network problems. Such systems integrate the flexi ...

2 [Performance evaluation of the Orca shared-object system](#)

Henri E. Bal, Raoul Bhoedjang, Rutger Hofman, Cerial Jacobs, Koen Langendoen, Tim Rühl, M. Frans Kaashoek

February 1998 **ACM Transactions on Computer Systems (TOCS)**, Volume 16 Issue 1

Full text available: pdf (179.39 KB)

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Orca is a portable, object-based distributed shared memory (DSM) system. This article studies and evaluates the design choices made in the Orca system and compares Orca with other DSMs. The article gives a quantitative analysis of Orca's coherence protocol (based on write-updates with function shipping), the totally ordered group communication protocol, the strategy for object placement, and the all-software, user-space architecture. Performance measurements for 10 parallel applications ill ...

Keywords: distributed shared memory, parallel processing, portability

3 ["Topologies"-----distributed objects on multicomputers](#)

Karsten Schwan, Win Bo

May 1990 **ACM Transactions on Computer Systems (TOCS)**, Volume 8 Issue 2

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Application programs written for large-scale multicomputers with interconnection structures known to the programmer (e.g., hypercubes or meshes) use complex communication structures for connecting the applications' parallel tasks. Such structures implement a wide variety of functions, including the exchange of data or control information relevant to the


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